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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,458	07/27/2006	Hajime Yamamoto	01272.519972.	2268
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EXAMINER ZIMMERMANN, JOHN P				
ART UNIT 2861		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/587,458

Applicant(s)

YAMAMOTO, HAJIME

Examiner

John P. Zimmermann

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-26 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 16-26 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 14 April 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-85/86)
Paper No(s)/Mail Date 07Feb08 & 14APR08
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings were originally objected to for failing to meet all of the requirements. The replacement drawings as submitted overcome the objection and it has hereby been withdrawn.

Information Disclosure Statement

2. The Information Disclosure Statement (IDS) filed 07 February 2008 repeats a reference (US 6,422,674) previously submitted. This reference has been crossed off to prevent obfuscation of the record.

Specification

3. The disclosure of the specification was originally objected to because of informalities that have since been addressed. The corrections and amendments are accepted and the objection is hereby withdrawn.

Claim Amendments

4. **Claims 1-15** have been cancelled as per Applicant's request.
5. **Claims 16-26** have been newly added as requested and examined as follows.

Claim Rejections - 35 USC § 103

6. The applicant has cancelled **claims 1-15**; therefore the 35 U.S.C. 103(a) rejection of these claims is moot.

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. **Claims 16-18 & 22-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Koitabashi et al., (US 6,012,808 A) in further view of **Hinami et al.**, (US 6,422,674 B1).

- a. As related to independent **claim 16**, Koitabashi et al. teach an ink tank (Koitabashi et al. – Figure 62A, Reference #4006, shown below), for use in an inkjet printing apparatus wherein the inkjet printing apparatus includes a light emitting section and a light receiving section (Koitabashi et al. – Figure 62A, Reference #4043 & #4044, shown below), and an inkjet head to which ink in said ink tank is supplied (Koitabashi et al. – Abstract & Figure 4, Reference # 20, shown below).

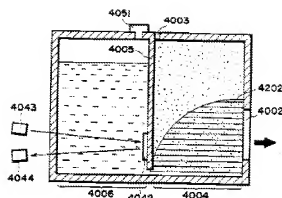


FIG. 62A

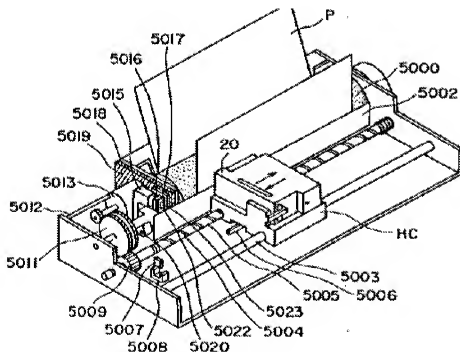
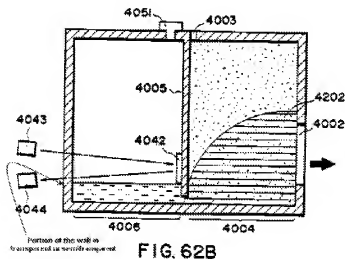


FIG. 4

- b. Continuing with **claim 16**, Koitabashi et al. teach the ink tank comprises an ink accommodating chamber directly accommodating ink, said ink accommodating chamber having a light transmittance portion (Koitabashi et al. – Figure 62B, Reference #4006 & Arrows, shown below), and an optical reflector disposed so that a reflecting surface

thereof faces an interior of said ink accommodating chamber to make an optical path formed by an incidence path and a reflection path, wherein the incidence path comprises a path along which a light emitted from the light emitting section passes through the light transmittance portion and reaches the reflecting surface, and wherein the reflection path comprises a path along which a reflected light by the reflecting surface passes through the light transmittance portion again and reaches the light receiving section (Koitabashi et al. – Detailed Description, Column 32, Lines 21-35 and Figure 62B Reference #4042 & Arrows, shown below).



c. Continuing with **claim 16**, while Koitabashi et al. teach the majority of **claim 16**, as shown above, Koitabashi et al. *do not* specifically teach the reflecting surface crosses a vertical direction when said ink tank is placed in a use position. *However*, Hinami et al. teach a liquid supply system with an ink tank for use in an inkjet printing apparatus with an optical reflector disposed so that a reflecting surface faces an interior of the ink tank and is disposed so that its reflecting surface crosses a vertical direction when said ink tank is placed in a use position in the inkjet printing apparatus (Hinami et al. – Title;

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Abstract; Figure 20, Reference #150, #182, #181, & #183 and Figure #26, both shown below).

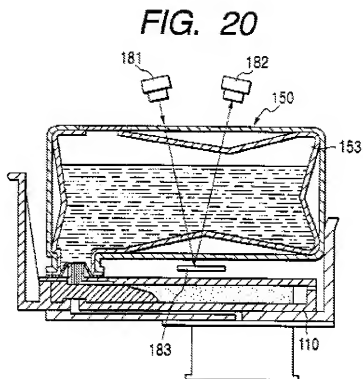
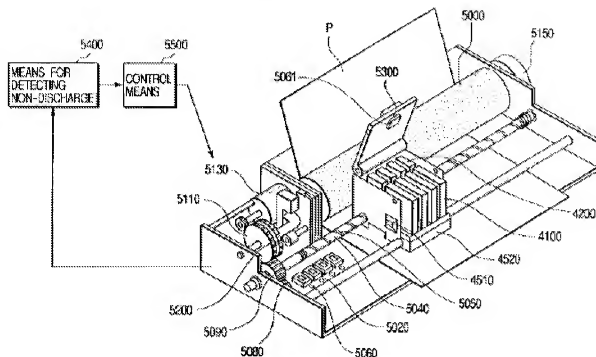


FIG. 26



d. As related to dependent **claim 17**, the combination of Koitabashi et al. and Hinami et al. teach the limitations of **claim 16** for the reasons above and additionally teach the optical reflector is disposed so that its reflecting surface faces the vertical direction when said ink tank is placed in the use position (Hinami et al. – Title; Abstract; Figure 20, Reference #150, #182, #181, & #183, shown above).

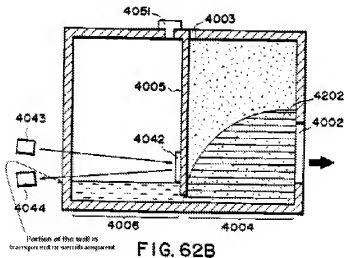
c. As related to dependent **claim 18**, the combination of Koitabashi et al. and Hinami et al. teach the limitations of **claim 16** for the reasons above and additionally teach wherein the light emitted from the light emitting section reaches the reflecting surface along the incidence path in which ink and air thereon are present, and the reflected light reaches the light receiving section along the reflection path in which air and ink are present, the reflection path being almost the same as the incidence path, and

wherein said optical reflector is disposed on a portion to cause a change in received light quantity by the light receiving section, the change in received light quantity being based on a change of distance over which the light travels through the ink, the change of distance being based on a change of an ink level with a use of the ink (Hinami et al. – Title; Abstract; Detailed Description, Column 28, Line 55 – Column 29, Line 10; and Figure 20, Reference #150, #182, #181, & #183, shown above).

Given the same field of endeavor, specifically a liquid tank, one for use as an ink storage container in an ink jet printing apparatus, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink container and the ink jet recording apparatus with a feature for determining the remaining amount of ink or a low ink status that includes all of the above mentioned characteristics and what is well known in the art of ink containers and ink level detection as taught by Koitabashi et al. with the feature for determining the remaining amount of ink that includes placement of the light emitting section and light receiving section as well as the optical reflector and other components involved with the detection of such data as taught by Kosugi et al., in an effort to provide a ink container and an ink jet recording apparatus with an ink container and ink level detection system that provides the remaining amount of ink that is detected by any of a number of means (Koitabashi et al. – Detailed Description, Column 31, Lines 36-40) while providing a system for determining the level of ink remaining [i.e. ink residual amount] and provide a user with a notification of time to exchange the ink tank [i.e. liquid containing chamber] (Hinami et al. – Abstract).

f. As related to independent **claim 22**, Koitabashi et al. teach an ink tank (Koitabashi et al. – Figure 62A, Reference #4006, shown below), for use in an inkjet printing apparatus wherein the inkjet printing apparatus includes a light emitting section

g. Continuing with **claim 22**, Koitabashi et al. teach the ink tank comprises an ink accommodating chamber directly accommodating ink, said ink accommodating chamber having a light transmittance portion (Koitabashi et al. – Figure 62B, Reference #4006 & Arrows, shown below), and an optical reflector disposed so that a reflecting surface thereof faces an interior of said ink accommodating chamber wherein the reflecting surface reflects light emitted from the light emitting section through the light transmittance portion and incident on the reflecting surface, and reflects the incident light toward the light receiving section through the light transmittance portion again (Koitabashi et al. – Detailed Description, Column 32, Lines 21-35 and Figure 62B Reference #4042 & Arrows, shown below).



h. Continuing with **claim 22**, while Koitabashi et al. teach the majority of **claim 22**, as shown above, Koitabashi et al. *do not* specifically teach a measurement state of an amount of ink in said ink tank. *However*, Hinami et al. teach a liquid supply system with an ink tank for use in an inkjet printing apparatus with optical reflector disposed so that both of an incidence path from the light emitting section to the reflecting surface and a

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reflection path from the reflecting surface to the light transmittance portion cross an ink level, in a measurement state of an amount of ink in said ink tank (Hinami et al. – Title; Abstract; Figure 20, Reference #150, #182, #181, & #183 and Figure #26, both shown below).

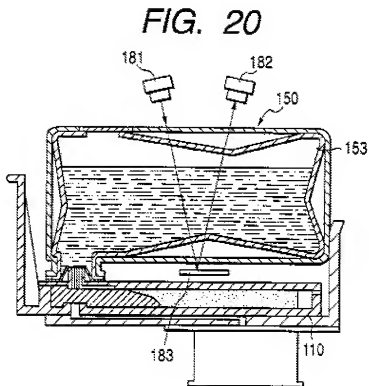
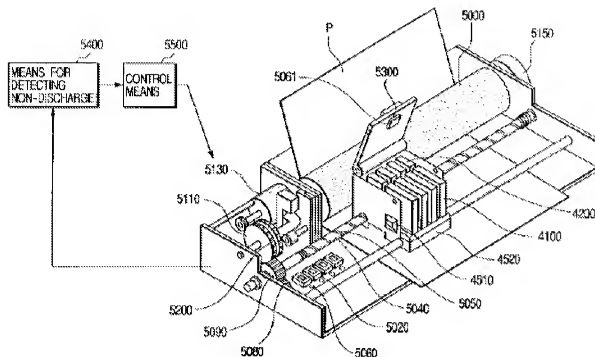


FIG. 26



- i. As related to dependent **claim 23**, the combination of Koitabashi et al. and Hinami et al. teach the limitations of **claim 22** for the reasons above and additionally teach the optical reflector is disposed so that its reflecting surface faces the vertical direction when said ink tank is placed in the use position (Hinami et al. – Title; Abstract; Figure 20, Reference #150, #182, #181, & #183, shown above).

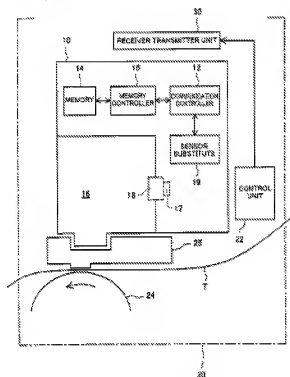
Given the same field of endeavor, specifically a liquid tank, one for use as an ink storage container in an ink jet printing apparatus, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink container and the ink jet recording apparatus with a feature for determining the remaining amount of ink or a low ink status that includes all of the above mentioned characteristics and what is well known in the art of ink containers and ink level detection as taught by

Koitabashi et al. with the feature for determining the remaining amount of ink that includes placement of the light emitting section and light receiving section as well as the optical reflector and other components involved with the detection of such data as taught by Hinami et al., in an effort to provide a ink container and an ink jet recording apparatus with an ink container and ink level detection system that provides the remaining amount of ink that is detected by any of a number of means (Koitabashi et al. – Detailed Description, Column 31, Lines 36-40) while providing a system for determining the level of ink remaining [i.e. ink residual amount] and provide a user with a notification of time to exchange the ink tank [i.e. liquid containing chamber] (Hinami et al. – Abstract).

10. **Claims 19-21 & 24-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koitabashi et al.**, (US 6,012,808 A) and **Hinami et al.**, (US 6,422,674 B1) as applied to **claims 16 & 22** above, and further in view of **Kosugi et al.**, (US 7,101,012 B2).

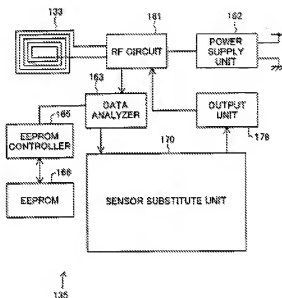
a. As related to dependent **claim 19 & 24**, the combination of Koitabashi et al. and Hinami et al. remains as applied above and continues to teach the optical reflector disposed in/on the ink tank (Koitabashi et al. – Figure 62B, Reference #4042, shown previously), but *does not* specifically teach an information storage element integrated with the optical reflector as part of an ink remaining amount sensing module. *However*, Kosugi et al. teach a liquid tank with a liquid remaining amount sensing module including an information storage element [i.e. memory] disposed on the tank as well (Kosugi et al. – Description, Column 5, Lines 8-11 and Figure 1, Reference #14, shown below) thereby integrated with the optical reflector to construct an ink remaining amount sensing module.

Fig.1



b. As related to dependent **claim 20 & 25**, the combination of Koitabashi et al., Hinami et al., and Kosugi et al. teach the limitations of **claim 19 & 24** for the reasons above and additionally teach the ink remaining amount sensing module is disposed to face an outer surface of a housing of said ink tank and is constructed to transmit and receive information to and from an external device via an electric contact disposed on a part facing the outer surface (Kosugi et al. – Description, Column 9, Lines 25-42; Figure 6, Reference #121, shown above; and Figure 7, Reference #133, #161, & #162, shown below).

Fig.7



c. As related to dependent **claim 21 & 26**, the combination of Koitabashi et al., Hinami et al., and Kosugi et al. teach the limitations of **claim 19 & 24** for the reasons above and additionally teach the ink remaining amount sensing module is disposed on an outer surface of a housing of said ink tank and is constructed to transmit and receive information to and from an external device in a non-contact manner (Kosugi et al. – Description, Column 8, Lines 3-8; Column 9, Lines 25-42; and Figure 7, Reference #133 & #161, shown above).

Given the same field of endeavor, specifically a liquid tank, one for use as an ink storage container in an ink jet printing apparatus, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink container and the ink jet recording apparatus with a feature for determining the remaining amount of ink or a low ink status that includes all of the above mentioned characteristics and what is well known in the art of ink containers and ink level detection as taught by

the combination of Koitabashi et al. and Hinami et al. with the types and locations of the components involved with the detection and the storage and transmittal of such data as taught by Kosugi et al., in an effort to provide a ink container and an ink jet recording apparatus with an ink container and ink level detection system that provides the remaining amount of ink that is detected by any of a number of means (Koitabashi et al. – Detailed Description, Column 31, Lines 36-40) while providing a system for determining the level of ink remaining [i.e. ink residual amount] and provide a user with a notification of time to exchange the ink tank [i.e. liquid containing chamber] (Hinami et al. – Abstract), as well as a system for determining the level of ink remaining and transmitting the information to be used by a control system and applying it as need for controlling of the printing (Kosugi et al. – Abstract and Summary, Column 2).

Response to Arguments

9. Applicant's arguments with respect to **claims 16 & 22** have been considered but are moot in view of the new ground(s) of rejection.
10. With respect to **claims 16 & 22**, and therefore **claims 17-21 & 23-26**, which inherently contain all of the limitations of independent **claim 16 & 22**, applicant's new claims warranted a further search which produced brought to light previously unnecessary teachings contained in the prior art of record. Applicant argues "(in the present invention) the returned light can be interpreted so as to determine a quantity of ink remaining in the ink tank," "Koitabashi shows a light reflecting element 4042 which is arranged in a horizontal reflecting arrangement," and "it is not possible to reposition Koitabashi's reflecting element... since its position near the bottom of the ink accommodating chamber is important." In response to applicant's argument that "(in the present invention) the returned light can be interpreted so as to determine a quantity of ink remaining in the ink tank," Examiner respectfully points out that the new grounds of rejection as

detailed above and as was necessitated by the applicant's amendments, clearly teaches the determination of a quantity of ink remaining in the ink tank. In response to applicant's argument that "Koitabashi shows a light reflecting element 4042 which is arranged in a horizontal reflecting arrangement," Examiner respectfully points out that the combination as indicated above clearly teaches a light reflecting element arranged in a vertical reflecting arrangement or horizontal reflecting arrangement. In response to applicant's argument that "it is not possible to reposition Koitabashi's reflecting element... since its position near the bottom of the ink accommodating chamber is important," Examiner respectfully points out that the variety of positions available for the placement of the reflecting element is clearly depicted by the references above and do in fact teach the optical reflector disposed near the bottom or just as easily the top as either position is equally functional to provide an incidence path and a reflection path to and from a reflecting surface of an optical reflector that cross an ink level, in a measurement state of an amount of ink in the ink tank. As no further arguments were made, the remaining dependent claims have been rejected accordingly.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. ***Examiner's Note:*** Examiner has cited particular Figures & Reference Numbers, Columns, Paragraphs and Line Numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Zimmermann whose telephone number is (571)270-3049. The examiner can normally be reached on Monday - Thursday, 7:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUU MATTHEW/
Supervisory Patent Examiner, Art Unit 2861


JPZ